WyreStorm

WyreStorm 4K Matrix Solutions

MX-0808-PP-POH-4K

4K HDBaseT™ 5-Play™ 8x8 Matrix including PoH, Bidirectional IR and RS232 Serial Control

Instruction Manual

Thank you for choosing this WyreStorm product.
Please read these instructions carefully before installing to avoid complications later.

Contents

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1.   Introduction

As the flagship model of the WyreStorm matrix range, the MX-0808-PP-POH-4K 8x8 matrix offers distribution and control of both UltraHD 4K content @ 30Hz up to 70m/230ft as well as HDBaseT Class A transmissions of 1080p/48bit @ 60Hz up to 100m/328ft along a single Cat6 cable.

Boasting a full HDBaseT 5Play feature set including video, multichannel HD audio, discrete internal IR routing with RS232 control and network switching for LAN, Ethernet pass-through and 100W power to display zones, this latest evolution of the diverse WyreStorm matrix range makes an already strong feature set future-proof by offering 4K support at 30Hz with 24bit true color and chroma sub-sampling rates of 4:2:2 for a superior color palette in UltraHD.

Featuring a module-based chassis design consisting of HDMI In, HDBaseT Out and switched HDMI out, the MX-0808-PP-POH-4K is capable of feeding up to 16 screens from a single unit in an 8x8+8 configuration, each including serial control and Power-over-HDBaseT functionality to display zones to power super-slim PoH display receivers (sold separately) for more convenient installations behind even the slimmest display wall mounts.

As with other models in the PP-POH range, the MX-0808- PP-POH-4K includes extensive internal EDID management using pre-set, stored or recalled settings via control software to negotiate communication between connected source/display devices with full compatibility with leading third party control systems including the WyreStorm Enado multi-platform browser-based control interface.

Seeking to avoid compatibility issues encountered by some manufacturers with certain display devices, the WyreStorm MX-0808-PP-POH-4K is tested compatible with all currently available 4K screens, CI and commercial control systems, graphics cards and consumer devices that may form part of any present 4K project, while future 4K compatibility is assured through flexible modular transmission capable up being updated as technical standards such as HDCP 2.2 come into effect or should client distribution needs change to include 4K at a later date.

For further information on this product and other WyreStorm ranges, visit our website or download our latest product guide.

wyrestom.com

CONTENTS AND INTRODUCTION

2.   Features

• Independent switching and control of UltraHD 4K or full HD HDMI sources to 8 individual HDBaseT or HDMI outputs for a total of 16 possible UltraHD 4K display outputs*

• Transmits 4K transmissions up to up to 70m/230ft and 1080p HDBaseT transmissions up to 100m/328ft

• Supports UHD (3840) & DCI (4096) 2160p resolutions up to 30Hz

• 4K chroma sub-sampling color palette 4:2:2 @ 4K/24bit at 30Hz // 1080p/48bit Deep Color at 60Hz

• HDBaseT Class A with full 5-Play compliance for one-cable transmissions of full HD 1080p video @60Hz, HD multichannel audio, Ethernet, serial control and power up to 100m/328ft under recommended conditions**

• Multichannel audio up to 7.1 including DTS Master HD & Dolby TrueHD

• Full 3D up to 1080p @60Hz - frame packing (Blu-ray) & stereoscopic (satellite/cable)

• HDMI 1.4b with 4Kx2K – 10m/33ft distance supported (7m/23ft recommended)

• Flexible control options – front panel buttons, local IR, IR call-back from remote locations, RS232, RS485 and LAN (Telnet and Web GUI)

• Bidirectional, wide range IR control of inputs/outputs from source and display locations via discrete IR control (30 KHz to 56 KHz frequency) with IR Code Edit function

• RS232 serial control with third party control integration (see website for compatible systems)

• Additional infrared extension port for longer IR connections

• Remote control can be learned into a universal remote handset to allow the control of multiple devices from one handset

• Supports Ethernet routing through matrix to any of the eight HDBaseT receivers at display zones location for network communication

• PoH – No mains supply required at display locations - power passed from matrix within HDBaseT transmission to all connected PoH-enabled receivers

• EDID management via DIP switches to read and copy EDID from connected devices to aid communication and device compatibility

• Outputs cascadable up to 7 times for even larger distributions spanning 56 displays covering a transmission distance of up to 1.2Km/ 0.74miles

• Quick Sync™ technology for virtually instantaneous I/O switching

• HDCP compliant with constant feed to prevent screen drop-outs

• Conforms to IEEE-568B standards

• 2U chassis size

* HDMI mirror outputs require EXP-SCL-DAC-4K scalers on each output for UHD 4K

** Recommended transmission conditions denote cable run within specified distance range of product, no electrical interference, the use of straight cable runs with no bends or kinks and no patch panels or wall outlets used. The presence of any of these factors may compromise bandwidth and signal strength.

HDMI Cable Performance Guide								MX-0808-PP-POH-4K		
0m	10m	20m	30m	40m	50m	60m	70m	80m	90m	100m
0ft	32ft	65ft	98ft	131ft	164ft	197ft	230ft	262ft	295ft	328ft

4K Transmission   **HD** Transmission

3.   Safety Precautions

WARNING
To reduce the risk of fire, electric shock or product damage:

1. Do not expose this apparatus to rain, moisture, sprays, drips or splashes and ensure that no objects containing liquids are placed on the apparatus, including cups, glasses and vases.

2. Do not place this unit in a confined space such as enclosed shelving, cabinets or bookshelves. Ensure the unit is adequately ventilated.

3. To prevent the risk of electric shock or fire hazard due to overheating, do not cover the unit or obstruct ventilation openings with material, newspaper, cardboard or anything that may restrict airflow into the unit.

4. Do not install near external heat sources such as radiators, heat registers, boilers or any device that produces heat such as amplifiers or computers and do not place near sources of naked flame.

5. Unplug apparatus from power supply during lightening storms or when unused for long periods of time.

6. Protect the power cable from being walked on, pinched or restricted in any way, especially at plug connections.

7. Only use attachments/accessories specified by the manufacturer.

8. Units contain non-servicable parts - Refer all servicing to qualified service personnel.

4.   Package Contents

1 x MX-0808-PP-POH-4K main chassis unit
1 x Printed instruction manual
1 x Flash memory USB stick containing PC control software and digital copy of instruction manual (digital version downloadable from product page)
8 x IR Receivers (30KHz to 50KHz)

8 x IR Emitters (For source devices)
1 x IR RX extension cable (38KHz for local IR control)
1 x 100-240v AC power supply
1 x USB to Serial cable
1 x pair matrix mounting brackets

5.   Specification

Technical

I/O Connections	8 x HDMI IN 8 x HDBT OUT 8 x HDMI OUT 8 x IR RX 8 x IR TX 1 x IR Extension 1 x EDID DIP Switch 1 x Ethernet 1 x LAN 1 x RS232 1 x RS485
Output Bandwidth Signaling Rate	6.75Gbps
Input video Signal	0.5-1.0 volts p-p
Input DDC Signal	5 volts p-p (TTL)
Maximum Pixel Clock	297MHz
Video Impedence	100 Ω
Power Supply	AC 100~240V 50/60Hz
Power Consumption	180W Max
BTU Rating	614
Video Format Supported	480i, 576i, 480p, 576p, 720p, 1080i, 1080p @ up to 60Hz 3840x2160 @ 30Hz, 4096 x 2160 @ 30Hz
Audio Format Supported	Stereo, LPCM 5.1, LPCM 7.1, Dolby True HD, DTS-HD Master Audio
Output Video	HDMI 1.4 with HDCP + full 3D
Storage Temperature	-4°F to 140°F (-20°C to 70°C) 10% to 90%, non-condensing
Control Method	IR control Front panel buttons RS232 RS485 LAN
Operating Temperature	32°F to 95°F (0°C to 35°C) 10% to 90%, non-condensing
Storage Temperature	-4°F to 140°F (-20°C to 70°C) 10% to 90%, non-condensing
ESD Protection	±8kV (air-gap discharge) ±4kV (contact discharge)
Surge Protection	Voltage: ±1kV

Cable Specifications

NOTE: Cable types below are for reference only. It is strongly recommended that you use the cables recommended by HDBaseT. WyreStorm suggest the use of straight-through Ethernet cables terminated to T568B standards.

Cable Type	Range	Supported Video
Cat5e/6	100m/328ft	1080p @ 60Hz / 36bit Deep Colour
	70m/230ft	1080p @ 60Hz / 48bit Deep Colour 1080p @ 60Hz 3D 4Kx2K @ 30Hz / 4:2:2 chroma sub-sampling
Cat6a/7	100m/328ft	1080p @ 60Hz / 48bit Deep Colour 1080p @ 60Hz 3D 4Kx2K @ 30Hz / 4:2:2 chroma sub-sampling

! **Please note cable type, range and supported video limitations. Successful transmission may not be achievable with cable or distances other than those specified. Please ensure cable distance does not exceed stated range.**

General

Dimensions (WxHxD)	438mm x 87.7mm x 396mm / 17.2" x 3.5" x 15.6"
Mass (Main unit)	7.46kg / 16.45lbs
Certifiication	CE, FCC, RoHS

6. Front Panel Description

1 LED input/output select screen - Displays matrix switching status for each connected input/output

2 IR receive window - Receives control signals from IR control handset (accepts commands for this model matrix only)

3 Input select buttons (UP/DOWN) - Selects input source by pressing up/down selection - Press ENTER to confirm selection
Note: Selection will not be made unless Enter is pressed

4 Output select buttons (left/right) - Selects output using the left /right selection button - Press ENTER to confirm selection
Note: Selection will not be made unless Enter is pressed

5 Enter - Press to confirm input/output selection

7. Rear Panel Description

1 Mirrored HDMI OUT ports 1~8 (From left to right) - Mirrored to HDBaseT output, connects to the local HDMI devices with HDMI or DVI to HDMI cables.

NOTE: this port supports up to 1080p resolution only. A 4K source cannot be duplicated

2 HDBaseT OUT ports 1~8 (From left to right) - Connects to HDBT IN ports of compatible HDBaseT Receivers (such as RX-70-4K) with single Cat5e/6 cable for transmission of HDMI Audio/Video, IR, RS232, Ethernet and 100W power.
NOTE: HDMI OUT has higher priority over HDBT OUT if both are connected.

3 HDMI IN ports 1~8 (left to right) - Connects to the local HDMI source devices with HDMI cables or DVI to HDMI cables.

4 IR RX Receiver ports 1~8 (left to right) - Connects to the supplied broadband IR receivers for IR signal reception to control the IR devices remotely from the matrix side.

5 Ethernet port - Connects to an active IP network to share network access with any of the eight Ethernet equipped devices at the HDBaseT end.

6 RS485 port - Connects to a RS485 device, such as a PC or control system device, with a RJ45 to RS485 converter and a serial cable for matrix control.

7 LAN port - Connects to an active IP network for control of matrix via LAN (Telnet & Web GUI).

8 RS232 port - Connect to a RS232 device, such as a PC or control system device, with the supplied USB to UART cable or a direct serial cable for matrix control or firmware upgrading.

9 IR Ext. port - Connects to a supplied IR receiver (not broadband cable) for IR signal reception to locally control the matrix.

10 EDID DIP switch - Manual DIP setting for EDID management for improved device connection compatibility. (See EDID section for settings)

11 EDID DIP switch default setting diagram - Default factory setting reference

12 Update mode switch
- Left position for Normal mode (default) – Normal matrix function including RS232 control.
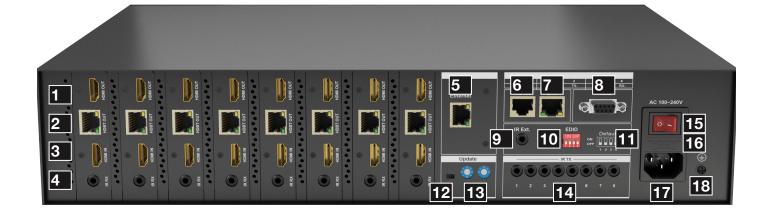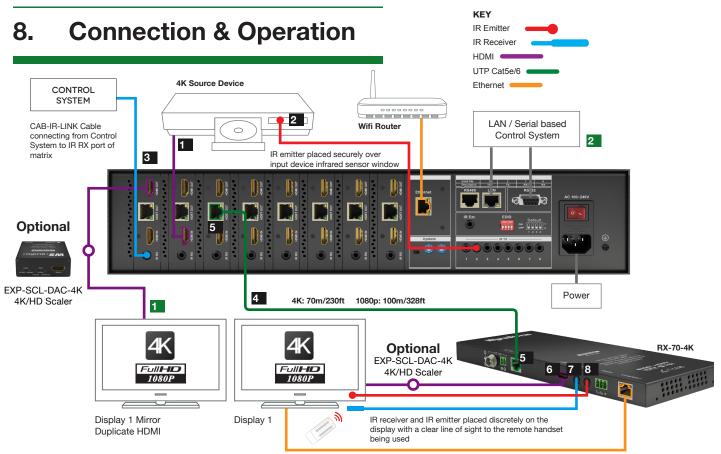 **Note: Matrix software cannot be updated in this setting.**
- Right position for Update mode – normal matrix function without RS232 control functionality. RS232 required for firmware update.

Note: Ensure switch is returned to the left 'Normal' mode after updating for full RS232 control functionality.

RS232 cable required for firmware update.

13 Firmware Upgrade DIP switches - DIP settings to update transmission card firmware.

14 IR TX ports 1~8 - Connects to the supplied IR emitters for IR signal transmission to control the IR devices remotely from the sink side.

15 Power switch - Powers matrix on/off

16 Fuse - To prevent voltage/current excess that can damage circuitry. Lift cover to replace fuse

17 Power - AC 100~240V 50/60Hz power input.

18 GND - Electrical grounding to prevent static build up

8. Connection & Operation

KEY
- IR Emitter
- IR Receiver
- HDMI
- UTP Cat5e/6
- Ethernet

The matrix allows any eight input channels (HDMI) to be routed to any eight output channels (HDBaseT or HDMI), regardless of source HDCP status, with HDMI OUT (up to 1080p) a higher output priority over HDBT OUT (up to 4Kx2K) if both are connected.

NOTES BEFORE INSTALLATION:

• Please be mindful of cable type and distance limitations stated in Specification (Section 5 of this manual) 4K: 70m/230ft   1080p: 100m/328ft

• PoH functionality of the matrix is designed for powering compatible HDBaseT RX-70-4K receiver units only. Non-PoH receivers will require their own local power supply. Non-WyreStorm display receivers may not be compatible with this matrix product

• Use of straight-through Ethernet cables wired to T568B standards is advised to achieve best results as recommended by HDBaseT

• Connect/disconnect all cables gently during installation and ensure power supplies are disconnected from all devices before installation

• Ensure that any 4K sources and 4K display devices used are compatible and outputting the correct resolutions for EDID to be successfully negotiated and signals received.

NOTE **Both 4K and 1080p HD sources and displays may be contained within the same distribution– to combine 4K and HD sources and displays a WyreStorm EXP-SCL-DAC-4K to HD/HD to 4K scaler must be used between connected HDMI display device**
Visit **wyrestorm.com** for more information on 4K/HD scaling and Dolby downmixing.

CONNECTION:

1 Connect source devices (such as: Blu-ray, computer, games console, satellite/cable, music streaming device, CCTV etc.) to the relevant input ports of the matrix output modules 1-8.

! **Do Not Hotswap HDMI plugs or HDBaseT connectors – Insert/extract cables carefully with devices and mains SWITCHED OFF to avoid power passed over the cable damaging circuitry.**

2 For IR control of sources from a display zone, connect an IR transmitter from the matrix to each source, ensuring the IR emitter is attached directly over the infrared receiving area of the device, using the adhesive backing to secure in place.

HINT Locate the infrared sensor on devices by shining a flashlight onto the display panel of sources and look for a small sensor.

CONNECTION & OPERATION

Adjustment of the IR emitter position after installation may be required to achieve the best results as moving to different areas of the source fascia can improve IR performance.

Plug the 3.5mm jack of the IR emitter into the corresponding number IR TX port on the rear panel of the MATRIX.

`NOTE` **HDMI output supports up to 1080p only. 4K source cannot be duplicated. EXP-SCL-DAC-4K scaler is required to scale up the 1080p signal for connection to a local 4K screen**

3 For two-way IR control of display from source location:
i. Connect a WyreStorm IR link cable (CAB-IR-LINK) between the IR RX port on the matrix output modules to a control system.
or
ii. Connect 3.5mm jack of the IR receiver into the corresponding IR RX port on matrix output cards, ensuring the IR receiver eye is placed in clear view to receive an IR signal from the handset to be used to control.

4 Connect a good quality, well-terminated Cat 5e/6/7 cable with an RJ45 connector wired to 568B standard at both ends from the HDBaseT Output port of matrix transmission cards the UTP IN of the RX-70-4K display receiver. *

* Please be mindful of cable type, transmission range and 4K or HD support as stated in Specification (Section 5 of this manual)

`NOTE` **Although all WyreStorm products are tested using Cat5e as standard, we suggest using Cat6 as the preferred cable due to its improved transmission capabilities.**

5 Ensure both RJ45 connectors are pushed securely into each port and supported by the connector strain relief clip to prevent loosening.
If using a WyreStorm extender set, connect the transmitter device to the matrix via the HDMI port and connect to the RX-70-4K receiver via Cat5e/6/7.

`NOTE` **No power supply is required to the RX-70-4K if connected from the MX-0808-PP-POH-4K matrix or other PoH-enabled transmission device.**

The 12v power input on the display receiver is optional, and should be used only if there is insufficient power from the transmission device.

! **Power is passed along the Cat5e/6/7 cable so**

the quality of termination, cable and condition are essential for successful delivery of video, audio, control and power to receivers.
Poor quality terminations lead to intermittent performance and longer install times.

PoH functionality will not be possible if using a non-PoH enabled Receiver.

Sudden movement of the matrix and receivers could lead to loss of picture and sound if connections become loose or strained, resulting in unnecessary service call-backs. We strongly recommend using the mounting brackets supplied to secure devices.

6 Connect HDMI OUT of the RX-70-4K to the HDMI IN of the display device.

7 Plug the 3.5mm jack of the IR receiver into the IR RX port of the display receiver.

Place the IR receiver discretely on the front of the display with care taken to achieve a clear line of sight with the remote control to be used.

For two-way IR controlling the display from the matrix end: Plug the 3.5mm jack of the IR emitter into the IR TX port on the display receiver, ensuring the emitter is placed directly over the infrared receiving sensor of the display using the adhesive backing.
Again, adjustment of receiver and emitter position may be needed to achieve the best IR signal distribution.

8 Switch on the power to your input sources, displays, and any display receivers used.

! **All receivers must be connected to the matrix via UTP cable before matrix is powered on.**

As power forms part of the HDBaseT carrier signal, if a transmission link can not be established between matrix and display receiver, it is unlikely the receiver will be able to draw power.

Should such problems be experienced between transmission and receiving device, investigate the root cause of the issue by following the checklist in the Troubleshooting section of this guide.

9 Finally, switch on the matrix at the rear and your WyreStorm system should now be fully connected and ready for use.
If IR transmitters and receivers are correctly placed discrete control of both sources and displays will be possible from either location.

Technical Support: support@wyrestorm.com US: +1 866 677 0053 EU: +44 (0) 1793 230 343

! **Remember, always switch off the matrix before unplugging any inputs or outputs – follow last on, first off protocol.**

OPTIONAL CONNECTION:

1 If using a duplicate display or AVR mirrored to the HDBaseT Output, connect the display via the HDMI OUT port of the transmission card

NOTE **HDMI output supports up to 1080p only. 4K source cannot be duplicated.**

2 For control system integration, connect additional RJ45 terminated category cable or RS232 serial cable. See section 11 - RS232 Control for more details

Combined 4K and HD Distribution

If your distribution contains both 4K and 1080p sources and displays, the matrix will search for the most compatible EDID screen resolution between all connected devices, (typically the highest resolution ALL displays can support), which will in most cases result in resolution disparity and automatic downscaling 4K content to 1080p across all screens.

To maintain 4K resolutions to 4K screens in distributions containing lower resolution legacy displays, a WyreStorm EXP-SCL-DAC-4K scaler and Dolby downmixer should be used inline between HDMI devices to scale down 4K transmissions to 1080p HD 24fps, upscale 1080p HD to 4K at 30Hz or allow signal pass-through.

Furthermore, Dolby downmixing to stereo PCM enables multichannel audio up to 5.1 to be distributed to zones that can support it and automatically scaled down to compatible stereo PCM for those that cannot without sacrificing the integrity of the distribution.

Visit **wyrestorm.com** for more information on 4K/HD scaling and Dolby downmixing.

9.   Front Panel Control

The matrix is designed with ease of connection and control in mind with basic switching of source inputs to output displays achieved via the front panel control of the matrix and the front LED screen displaying the current input and output status of the matrix.

On power up, the front panel will flash as the matrix initialises. When the display stops flashing, the matrix is ready to use.
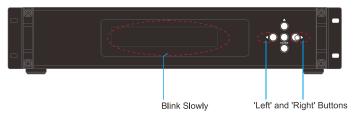

| INPUT selection | OUTPUT selection | Confirm OUTPUT/INPUT |

OUTPUTS are selected by pressing the LEFT and RIGHT arrow buttons to scroll forwards and backwards numerically through the displays connected to the matrix. The corresponding OUTPUT channel number will blink on the display when reached.

1 Press the LEFT ARROW or RIGHT ARROW key to select an output. After the selection is complete, the corresponding LED indicator blinks.

Blink Slowly   'Left' and 'Right' Buttons

Likewise, the UP and DOWN arrow buttons scroll numerically through any INPUT sources connected to the system. When the desired OUTPUT and INPUT is reached, push the ENTER button to confirm the selection. The display will stop blinking to confirm the matrix has been set.

2 Press the UP ARROW or DOWN ARROW key to select an input.

'Up' and 'Down' Buttons

3 Press the ENTER key to confirm the selection. After the selection takes effect, the LED stops blinking.

Enter button

Repeated pressing of the select button of a specific output scrolls numerically through the HDMI input devices connected to the matrix, with the corresponding LEDs illustrating when a device has been selected for that

particular output. The chosen input will automatically store for the output so, even when the matrix is powered off and on, the last selected input/output combination will remain.

Example

If outputs 1-4 need to be set to input 1 and outputs 5-8 need to be set to input 2, the following sequence of button presses need to be performed.

To switch output/input selection:

1 Set the output 1 to the input 1.

i. Press left/right selection button to highlight the Output 1. LED blinks slowly to indicate the output has been chosen.

ii. Press up/down selection button to switch that Output to Input 1.

iii. Press Enter button for the selection take effect. LED stops blinking to indicate the operation is successful and the Output has been set to the chosen input.

2 Repeat steps above to perform the other output/input selections. The final configuration is as follows.

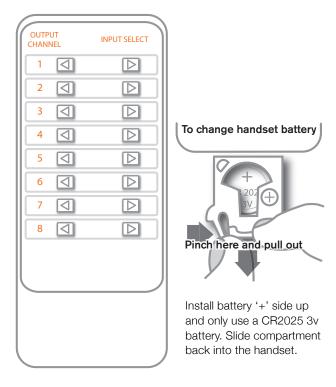# 10. Matrix IR Remote Control

The same basic switching functions can also be accessed via the remote control.

Simply toggle through the INPUT sources connected to the matrix by pressing the left/right arrow buttons in each numbered OUTPUT section on the handset.

Operation of the handset is the same regardless of location – locally (source/matrix location - IR TX) or Remotely (display location - IR RX).
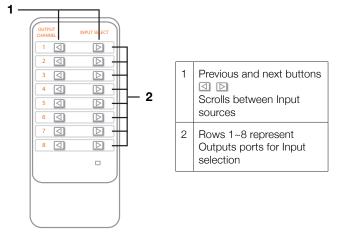
Note:

- Ensure IR receivers and IR emitters are fully connected to correct matrix ports and placed in clear view to receive IR signals from the remote (IR RX) and transmit signals to the matrix (IR TX)
- The remote handset must be pointed directly at the IR receiver window on the matrix fascia or the IR RX Extension receiver eye for signals to be received by the matrix.

To change handset battery

Install battery '+' side up and only use a CR2025 3v battery. Slide compartment back into the handset.

Pinch here and pull out

i) Matrix Control at Matrix Location (Local)

Local control of the matrix from the matrix location is achieved by sending IR command signals to the IR receiver window on the matrix or IR RX Extension receiver connected to the IR Ext. port at the rear of the matrix.
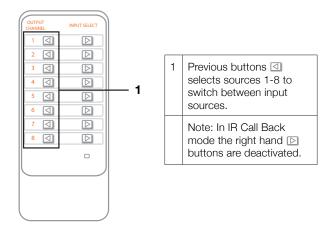

1	Previous and next buttons ◁ ▷ Scrolls between Input sources
2	Rows 1~8 represent Outputs ports for Input selection

When using the matrix remote locally, point the handset directly at the matrix or IR RX extension receiver and press ◁ ▷ are used to scroll between the connected input sources for each individual output display. For example, to select output display 1 to be set to input source 2, find row 1 on the matrix control handset and scroll ◁ ▷ to input source 2.

NOTE **Ensure IR emitters are securely placed over source IR sensor windows. You can locate IR sensors on devices by shining a flashlight onto the fascia – the sensor should be visible as a small round diode behind the device panel.**

ii) Matrix Control at the Display Device Location (Remote IR Call-Back)

Control of the matrix from the display location side using the matrix remote sends IR signals to the IR receiver connected to the HDBaseT display receiver, with the IR eye placed on or near the display device with clear line of sight to the handset controlling.

In this case, the matrix automatically detects which particular output location the user is in and only allows the selection of sources 1-8 for that location using the previous buttons.
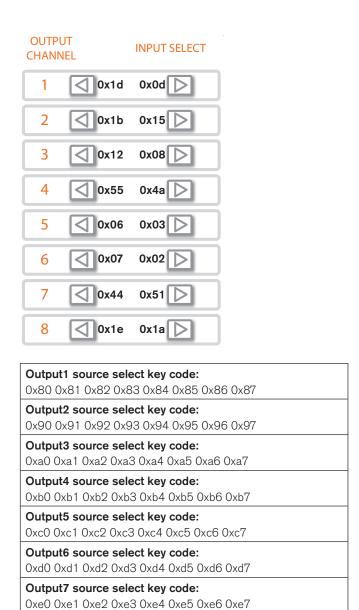
1	Previous buttons ◁ selects sources 1-8 to switch between input sources.
	Note: In IR Call Back mode the right hand ▷ buttons are deactivated.

For example, if the user is in the master bedroom with their display connected to the matrix via an HDBaseT receiver, scrolling ◁ 1-8 on the handset enables access to their desired input source.

NOTE **Ensure IR Call-Back function is ON when remotely controlling the matrix from the display device location. To activate IR Call-Back, click SETTING in Set Panel area of the COM control software and select ON for IR Back. (see COM control section of manual)**

iii) Advanced Remote Control

Please note: Due to the different available control methods based on location, if using a third party control system, learning the control from the IR is not recommended as control will be limited to scrolling up/down between inputs.

For reference: the IR is NEC and possesses a carrier wave of 38 KHz with a system code of 0x00.
The following two types of system IR codes can be learned using other IR remotes to control the matrix.

OUTPUT CHANNEL   INPUT SELECT

OUTPUT CHANNEL		INPUT SELECT	
1	◁ 0x1d	0x0d	▷
2	◁ 0x1b	0x15	▷
3	◁ 0x12	0x08	▷
4	◁ 0x55	0x4a	▷
5	◁ 0x06	0x03	▷
6	◁ 0x07	0x02	▷
7	◁ 0x44	0x51	▷
8	◁ 0x1e	0x1a	▷

Output1 source select key code:
0x80 0x81 0x82 0x83 0x84 0x85 0x86 0x87
Output2 source select key code:
0x90 0x91 0x92 0x93 0x94 0x95 0x96 0x97
Output3 source select key code:
0xa0 0xa1 0xa2 0xa3 0xa4 0xa5 0xa6 0xa7
Output4 source select key code:
0xb0 0xb1 0xb2 0xb3 0xb4 0xb5 0xb6 0xb7
Output5 source select key code:
0xc0 0xc1 0xc2 0xc3 0xc4 0xc5 0xc6 0xc7
Output6 source select key code:
0xd0 0xd1 0xd2 0xd3 0xd4 0xd5 0xd6 0xd7
Output7 source select key code:
0xe0 0xe1 0xe2 0xe3 0xe4 0xe5 0xe6 0xe7
Output8 source select key code:
0xf0 0xf1 0xf2 0xf3 0xf4 0xf5 0xf6 0xf7

NOTE **Refer to IR Set for details how to learn control from the IR using the COM Control software.**
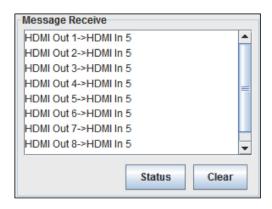
11. RS232 Control

Serial control of the matrix via RS232 enables third party control systems to be integrated within a MX-0808-PP-POH-4K system. The COMCTL software included with this product communicates via serial to enable advanced matrix features to be accessed, such as relaying system status and additional control of matrix settings, including full configuration of the matrix for optimum performance.

i) COM Control Software Home Screen

1	Set IP Address
2	EDID Settings
3	Advanced Settings
4	IR Settings
5	IR Matrix Settings
6	Matrix Firmware Upgrade
7	Message Receive Window
8	Matrix Status
9	Message Clear
10	Send Message Window
11	Send Message
12	COM Port Connect State
13	COM Port Select
14	Connect/Disconnect from Matrix
15	Output/Input Switch
16	Select Previously Saved Output State 1, 2 or 3
17	Save Current Output State 1, 2 or 3
18	Select All Outputs to One Input

ii) Message Receive Window

The Message Receive window displays information received from the matrix, such as messages regarding firmware version and input/output selections.

Options in the Message R eceive window include:

Status Press to view the current condition of all output ports.
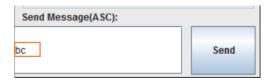
Clear Press to delete the previous received message.
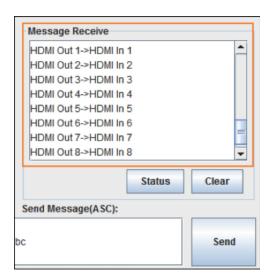
iii) Send Message Window

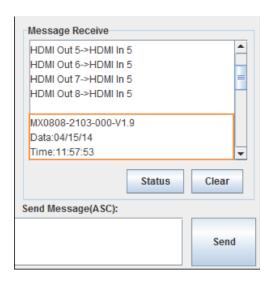In the Send Message window, messages can be sent to the matrix as follows:

1 Enter serial commands for the matrix, such as one of the instructions for outputs, bc + space (a space is required following)

2 Click Send to view the current condition of all output ports.

NOTE **To view the firmware version currently used in the system, reboot the matrix while it is connected to the COM Control software - firmware version and creation date will be displayed in the window.**

NOTE **When the matrix is in operation the control code of a certain actions are displayed in the Send Message window.**

iv) Connecting the Matrix to a COM Port

To connect the matrix to a COM Port:

1 Launch the COM Control software.

2 Use Port Select to select Com Port number

3 Click Connect to establish communication with selected Com Port.

When a COM Port is connected, the only option will be to Disconnect and vice versa.

Note: In Connect Status area:
- Connected: indicates that the matrix is connected to the COM port and communication is enabled.
- Disconnected: indicates that the matrix is disconnected from the COM port and communication is disabled.

v) Set Panel introduction

IP Settings

The matrix can also be controlled over LAN, through which it may be accessed though Web GUI or Telnet after obtaining the matrix IP address. By default, the IP address to access the matrix is assigned automatically by the router or switch with a DHCP server.

Obtaining an IP Address Automatically

1 Click IP SET in the Set Panel area to allow access to IP functions and obtain / store the IP address.

2 Select Automatically obtain IP address to enable the IP address to be detected automatically by the system. This option is selected by default.
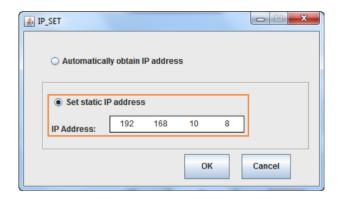
3 Click OK to store the IP address and click ▣✖ to exit.

Set a Static IP Address

1 Click IP SET in Set Panel area to allow access to IP functions to obtain and store the IP address.

2 Select Set static IP address to manually input the IP functions if no address appears or if the system is unable to detect an IP address. Enter an IP address (such as 192.168.10.8) ensuring the IP addresses of the matrix and your computer are in the same subnet segment.

3 Click OK to store the IP address and click ▣✖ to exit.

NOTE **Check if the matrix IP address has been set successfully by using Netfinder 'Logging in to matrix control screen' or 'Telnet' sections for further details.**

EDID Settings

The EDID SET window allows users to access and configure EDID settings that can be read, written, saved and recalled, with optimized viewing achieved by writing the output port of a particular display to a specific input port.

NOTE **EDID cannot be read from matrix output ports not connected to a display – check matrix outputs are connected to displays before attempting to read EDID.**
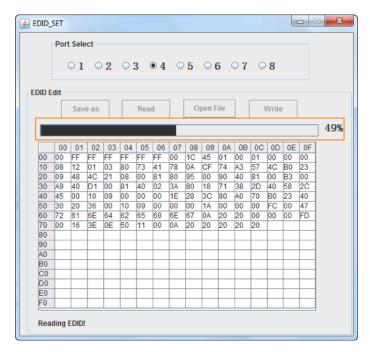
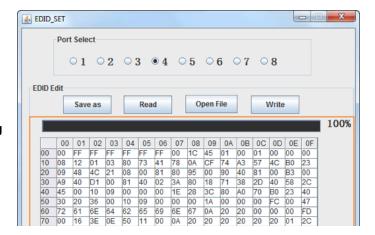**1** Click EDID SET in Set Panel area.

2 Select an output port from the Port Select area – such as output port 4 in this case.

3 Click Read to read EDID from the selected output port, with the status bar indicating percentage of read progress.
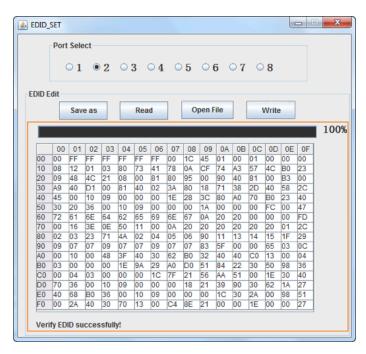
4 Once the reading process is complete, the output port EDID will appear in the table below.

5 Next, select an input port in the same Port Select area - such as input port 2 in this case - and click Write to save the current EDID to the selected input port.
Wait a few seconds for the process to complete.

6 Once the writing process is complete, click Save as to save the EDID as a bin file.

7 To write previously saved output port EDID in bin format, click Open File and choose the relevant bin file before selecting an input port and click Write. It is recommended this is done often if specific output EDID from particular display devices are frequently used.
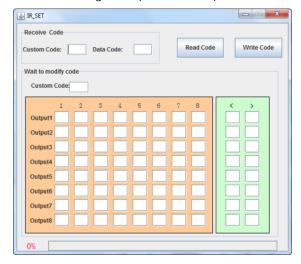
Configuring Advanced Settings

Advanced matrix settings can be configured by clicking SETTING in the Set Panel Area.

| 1 | UTP Long Cable Mode | In instances where the distance of the cable may be effecting transmission quality, this setting toggles ON/OFF to improve display quality.

Click Unlock, enter password 123456 and follow the on-screen instructions to activate UTP Long Cable Mode – reboot the matrix for the change to take effect. |
|---|---|---|
| 2 | IR Call Back | Toggles IR call back ON/OFF.
By default, this option is turned ON. IR call back function only allows remote control of the matrix inputs and outputs at the display end. |
| 3 | Copy EDID Setting | Copies output ports 1~8 EDID to specific input ports 1~8. |
| 4 | Factory Reset | Restores the matrix to its initial Default Setting as shipped.
Reboot the matrix for this setting to take effect.
Warning: This action will erase all previously saved data/settings – this cannot be undone. |
| 5 | Quick Switch | Quick Switch option is an alternative method of switching between sources that is faster than in Normal mode, resulting in less delay between input selection. Although faster, the means of switching has been found to be incompatible with some displays. As a result we recommend Normal Switch as the default setting due to reliability and compatibility with outputs. |

IR Set
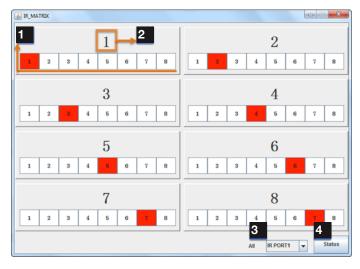
The matrix supports leading third party control systems and learning remotes that learn control from the IR – see the product page at **wyrestorm.com** for details of compatible control systems and available protocols. To access third party control configuration, click IR SET in the Set Panel area to enter new IR code or modify existing code and assign to inputs and outputs.

IR Matrix

The IR Matrix allows the creation of different IR paths to remotely control the IR devices, such as source or display devices using each device remote control from the matrix location.

IR Matrix Window Introduction
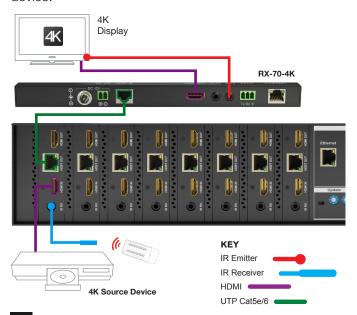

1	Indicates IR RX ports 1~8 of the matrix.
2	Indicates the IR TX ports 1~8 of the HDBaseT receivers connected to the HDBT OUT ports 1~8 of the matrix.
3	Selects a specific IR RX port for all IR TX ports.
4	Indicates the current status of IR matrix.

Configuration Example - controlling displays from matrix location

In this diagram, HDBT OUT port of the matrix is connected to HDBaseT receiver with IR emitters attached between each display/receiver, and Broadband IR receivers are connected to the matrix IR RX port in clear line of sight with the remote handset used to control the device.

1 Launch the COM Control software.

2 Click IR MATRIX in Set Panel area.

3 Switch between IR TX ports and IR RX ports, for example: Clicking #2 in IR TX port 1 enables the display

located in zone 1 to be controlled from source 2 location.
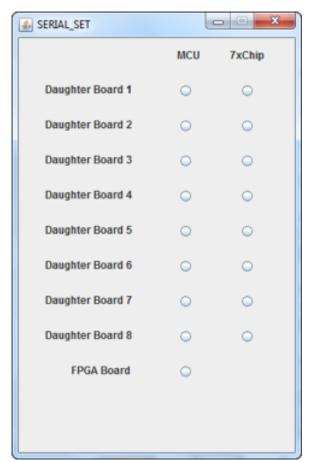
Clicking #1 in IR TX port 2 enables the display located in zone 2 to be controlled from source 1 location.
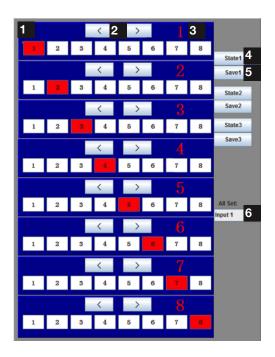
Updating Matrix Firmware

SERIAL SET in Set Panel area enables individual matrix transmission modules (daughter boards) or FPGA boards to be updated, with additional upgrade also possible using serial ports in the matrix circuit cards themselves.

vi) Input/Output Switch

The input/output switch allows selection of output port (display) and input port (source) for specific combinations of displays and sources within the matrix, with input/output selections states able to be saved and previously saved states loaded in to the switch.

1	Input port selection 1 ~ 8 – red when selected
2	Previous/next selection buttons - scrolls numerically between input sources
3	Output ports selection blocks 1 ~ 8
4	Recalls previously saved output/input configurations by clicking State buttons 1 ~ 3
5	Save output/input configurations by clicking Save buttons 1 ~ 3
6	Selects a specific input port from 1 ~ 8 to be used for all output ports

Configuration Example – Selecting Inputs and Outputs

To select between Input ports (sources) for Output port 2 (display):

1 Input port 3 is selected in Output Block 2.

2 Click [>] twice or press #5 directly to select Input port 5 for Output port 2.

3 To select the same Input port for all Output ports choose an Input port from the 'All Set' drop down box.

4 To save a configuration, click Save button 1, 2 or 3. Recall previously saved output/input configurations by clicking State button 1, 2 or 3.
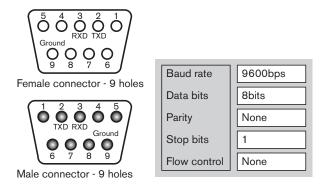
NOTE Only 3 configuration states can be saved or

recalled – saving a configuration will automatically overwrite the previously saved state. This action cannot be undone.

vii) Control Commands and Codes

COM Port Settings

The RS232 connection on the matrix is female DB9. Users can use a USB to UART cable or a direct serial cable for matrix control. See below for control system configuration.

Female connector - 9 holes

Male connector - 9 holes

Baud rate	9600bps
Data bits	8bits
Parity	None
Stop bits	1
Flow control	None

Command Format

For reference - the command format to be input is:
Type "cir" - followed by a "space" - then the "code number" – and hit the "Enter" key.
For example, the command cir 39 + "Enter", will tell the matrix to select the next input source for output 4.
See Matrix Control Codes section below for more details on code numbering

Matrix Control Codes

Command code input in the COM Control software follows a strict format for commands to be understood by the system. Care must be taken when inputting and checking code, with codes double-checked for input accuracy if commands are not accepted or incorrectly actioned by the matrix or control system.

Output 1	<"08"	"09">						
1 "00"	2 "01"	3 "02"	4 "03"	5 "04"	6 "05"	7 "06"	8 "07"

Output 2	<"18"	"19">						
1 "10"	2 "11"	3 "12"	4 "13"	5 "14"	6 "15"	7 "16"	8 "07"

Output 3	<"28"	"29">						
1 "20"	2 "21"	3 "22"	4 "23"	5 "24"	6 "25"	7 "26"	8 "27"

Output 4	<"38"	"39">						
1 "30"	2 "31"	3 "32"	4 "33"	5 "34"	6 "35"	7 "36"	8 "37"

Output 5	<"48"	"49">						
1 "40"	2 "41"	3 "42"	4 "43"	5 "44"	6 "45"	7 "46"	8 "47"

Output 6	<"58"	"59">						
1 "50"	2 "51"	3 "52"	4 "53"	5 "54"	6 "55"	7 "56"	8 "57"

Output 7	<"68"	"69">						
1 "60"	2 "61"	3 "62"	4 "63"	5 "64"	6 "65"	7 "66"	8 "67"

Output 8	<"78"	"79">						
1 "70"	2 "71"	3 "72"	4 "73"	5 "74"	6 "75"	7 "76"	8 "77"

Configuration Example - Control Code Introduction

Using Output1 as an example to explain control code definition and application – all other control command codes are identified in the same way.

Original Table

Output 1	<"08"	"09">						
1 "00"	2 "01"	3 "02"	4 "03"	5 "04"	6 "05"	7 "06"	8 "07"

Description Table

Output Port	Element		Description
Output 1	<"08"	<	Indicates the operation of selecting the previous input source for Output 1.
		08	• Indicates the control code of "<". • Sends the command cir 08"Enter" to select the previous input source for output 1.
	>"09"	>	Indicates the operation of selecting the next input source for output 1.
		09	• Indicates the control code of ">". • Sends the command cir 09"Enter" to select the next input source for output 1.
	1"00"	1	Indicates the operation of selecting input source 1 for output 1.
		00	• Indicates the control code of "1". • Sends the command cir 00"Enter" to select the input source 1 for output 1.
	2"01"	2	Indicates the operation of selecting input source 2 for output 1.
		01	• Indicates the control code of "2". • Sends the command cir 00"Enter" to select the input source 1 for output 1.
	Other control command codes are similarly defined		

If a control command is successfully sent to the device via the COM control software, the current output state selected will feedback to show the input port selected. The following table shows the return status format:

S	X1	X2	'\r'	'\n'

For example, if cir 51"Enter" is sent successfully to the matrix, it will feedback "s62", meaning output 6 has selected input 2.
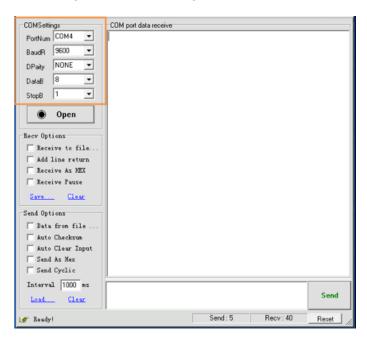
Read Status Command

The command length of the read status is 4 bytes. Type "bc" - followed by a "space" - and hit the "Enter" key.
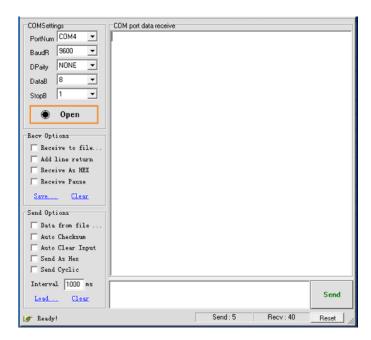
For example: bc + "Enter" instructs the matrix to feedback the current status of all outputs.

To read the current status of all outputs using the COM debug software:

1 Launch the COM debug software.
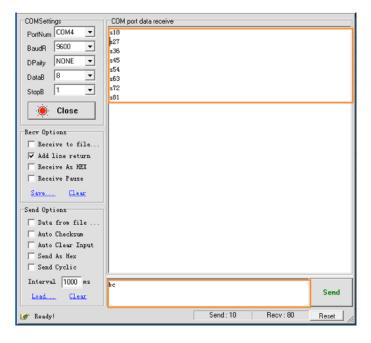
2 Configure the COM settings.

3 Click Open to connect this COM debug software to the matrix.

4 Enter the command bc + "Enter", which should give the resultant feedback from the system: "s18\r\n" ,"s27\r\n" ,"s36\r\n" ,"s45\r\n" ,"s54\r\n" ,"s63\r\n" ,"s72\r\n", "s81\r\n"

See below for an explanation on the meaning of this feedback message

Output Port	1	2	3	4	5	6	7	8
Selection	↓	↓	↓	↓	↓	↓	↓	↓
Input Port	8	7	6	5	4	3	2	1

viii) Controlling the IR Devices Remotely

The matrix allows the creation of different IR paths to remotely control the IR devices, such as sources or displays using device remote handsets from the display or source location.

Note:

1 Ensure IR receivers are securely connected to correct ports of receiver or matrix and placed in clear view to receive IR signals from device remote handsets.

2 IR emitters must be firmly connected to correct ports of matrix and securely attached directly over device IR sensor windows.

3 All IR cables should be free of bends, kinks, tangles, knots and any interference that may restrict signal transmission.
See Troubleshooting section should problems be experienced.
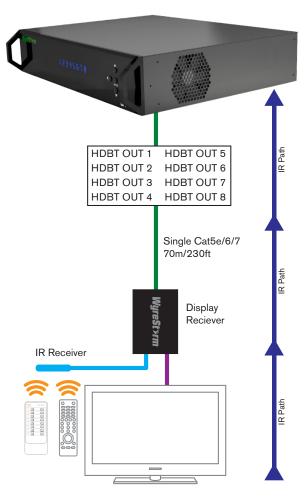
Controlling at the Display End

Combinations of matrix IR TX ports and HDBT OUT ports correspond to IR RX ports of HDBaseT receivers and change with the switching configuration of matrix inputs and outputs. By default, IR TX ports 1~8 correspond to HDBT OUT ports 1~8 in the matrix in sequence.

For example, if current output and input combinations in the matrix are as below, combinations of matrix IR TX ports, HDBT OUT ports and IR RX ports in the HDBaseT receivers will be as follows (Diagram right):

Output Port	1	2	3	4
Selection	↓	↓	↓	↓
Input Port	4	3	2	1

Configuration Example - Controlling Source Devices from Display Location

1 Create two IR paths for input/output combinations using either front panel buttons, RS232, matrix remote, LAN or RS485 to control.
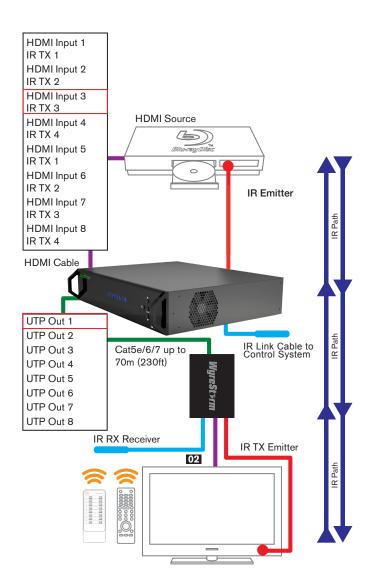
The combination of HDBT OUT ports corresponding to IR RX ports of HDBaseT Receivers and IR TX ports will be as follows:

Output Port	1	2	3	4
Selection	↓	↓	↓	↓
Input Port	4	3	2	1

Note:

2 Ensure that HDBT OUT port 1 and 2 are connected to their corresponding HDBaseT receivers with supplied broadband IR receivers securely attached, and that the supplied IR emitters are connected to the IR TX port 1 and 2 of the matrix.

3 Use source remote handsets to control the two source devices from the display side > To select input 3 for output 2 in the matrix, connect an IR emitter to the IR TX port 3 of the matrix to control the source.

NOTE **To control the matrix from the display location, see section Matrix Control at Display Location (Remote) in section Using the Matrix IR Remote.**

Controlling at the Matrix Location
For more information, see IR Matrix.

QuickSync™ Setting

WyreStorm QuickSync significantly enhances end-user experience by dramatically reducing the time needed to communicate HDCP encryption data between source devices, matrix and output devices from the typical several seconds of distracting blank screen to switching in fractions of a second.

By maintaining the initial HDCP handshake between devices rather than repeatedly negotiating each time a source is switched, QuickSync all but eliminates signal interruption that offers no advantage over local source switching, and actually detracts from the real benefit for the end-user.

With QuickSync, the result is virtually instantaneous switching, completely frameless with modern screens, indistinguishable from changing channels via the TV tuner, thus maximizing real advantages of matrix distribution and control for the end user.

NOTE **Depending on the settings of the incoming source content a delay may still exist where resolution between screen and source requires negotiation, but EDID is still communicated as normal when this the QuickSync feature is enabled.**

This feature is NOT enabled out of the box and must be manually activated within the COM CTL software. see page 15.

12.   EDID Management

About EDID

EDID (Extended Display Identification Data) is data generated from each display in the system to communicate the capabilities of the device (720p, 2ch Audio, 1080p, 7.1ch Audio).

For communication between devices to be made, and successful connection achieved, devices must both request and send the required information. For example, a display will communicate 1080p capability with 2ch audio, which the source device will accept and output the correct format for the display. Problems can arise when different types of devices such as displays, sources and amplifiers are used within a system, making communication between them that much more difficult; sometimes resulting in connection problems.

In such instances EDID needs to be streamlined or guided for all devices to work together, with matrices and receivers perfectly placed to handle this process as communication between display and source is the most important in the system. The effective control and management of EDID is essential for the success of any integration, with this being achieved in most cases using the default setting on the matrix and receivers.

Before EDID Adjustment

Communication between display, matrix and source devices should be automatically negotiated with the EDID DIP switch set to the default Normal Output (OFF) position. However, should device communication or compatibility issues be encountered during installation, please refer to the EDID DIP settings below.
 If the maximum capabilities of the display are known, for

example 1080p 3D with 2ch stereo audio, the DIP switch setting should be adjusted manually for matching EDID to be sent to the matrix.

If the specification of the display is not known, simply copy the EDID from the display to matrix through the HDMI connection by setting all switches to the EDID Copy or Force Output (ON) positions and power cycling the matrix for the DIP setting to become active.

i) EDID Presets

 Default EDID Setting
Copies HDMI display EDID to the selected input port

 Applies 1080p 3D stereo to all input ports.

 Applies 1080p stereo to all input ports.

 Applies 1080i stereo to all input ports.

 Applies 1080p 5.1 audio to all input ports.

 Applies 1080p 7.1 audio to all input ports.

 Applies 4Kx2K 2.0 stereo audio to all the input ports.

 No function – Reserved for future use

NOTE **DIP Switch Down denotes OFF / DIP Switch**

UP denotes ON.

EDID Switches that are marked in grey indicate the switch can be in any position.

Before copying output port EDID, ensure the matrix port is connected to a display - EDID copy will fail without connection to output device.

Matrix must be restarted for changes to DIP switch to take effect.

ii) Copying Output Port EDID

Example: To copy EDID from an HDMI display connected to matrix output port 1 to input port 2:

1 Set the EDID DIP switch to 000X ("X" position is unimportant for the setting), as per setting below.

Default EDID Setting
Copies HDMI display EDID to the selected input port

2 Reboot the matrix.

3 Press the selection buttons on the matrix front panel to select input port 2 on output port 1 > the number LED number indicator will blink to confirm action.

4 Press and hold the Enter button for approximately five seconds until the message CPY OK is displayed to confirm EDID copy is successful.

5 To apply EDID of the other HDMI displays to all the input ports, set the EDID DIP switch to the required position and reboot the matrix for the setting to take effect.

6 Output port EDID can also be copied to input ports using the COM Control software.
See EDID Settings for details.

13.　LAN Control

WyreStorm MX-0808-PP-POH-4K is fully compatible with all market leading control systems with full integration protocols available for Enado, AMX, Control 4, Crestron and RTI.

14.　Troubleshooting

Generally, the majority of HD distribution installation issues are either caused by minor connection errors, communication problems between devices, or when the transmission of high signal bandwidth is attempted using insufficient cable.

Should you encounter any technical difficulties when installing and configuring the matrix, we are confident solutions can be found by working through the following troubleshooting checklist before seeking alternative technical support.

No Picture or Poor Quality Picture

1) Power – are the HDBaseT receivers showing power? All units should be powered either by the matrix or an optional external power supply in cases where PoH does not function.

NOTE **Display receivers do not need to be independently powered if part of an HDBaseT PoH extender set or MX-PP-POH Matrix solution.**

Are all sources definitely powered and firmly connected?

2) If possible, always use test equipment prior to installation and to troubleshoot any problems.

3) Distance – Is the cable too long for the signal to be transmitted effectively? The HDBaseT classification used within the transmitters and receivers allow transmission of 1080p up to 100m/328ft and 4K up to 70m/230ft so make sure the cable distance matches the project requirements and is well within the maximum transmission distance of the signal.

NOTE **If approaching the limits of the transmission capabilities, transmission should be extended by using another extender set to ensure the signal reaches its destination effectively.**

4) Cable Joins – Joins in the cable run or RJ45 connectors can impact on signal strength, resulting in reduced transmission that may manifest itself in incorrect picture quality, picture dropping out or a complete lack of picture

5) Cable Choice and Signal Reduction – Are stranded patch leads being used as interconnects between patch

panels or wall outlets? CCA (Copper Clad aluminium) cables being used? These can reduce transmission rates by up to 40% – we recommend solid core straight through with minimum connections used wherever possible.

6) Correct connection – It may seem obvious but double check all UTP, HDMI, power and IR cables are connected to the correct ports.

NOTE **Even a fraction off can be the difference between a perfect picture and a blank screen. Double check all connections are firmly made in the correct ports.**

7) Cable wired to 568B standard? Is the cable wired and terminated correctly and are those terminations connected to the correct ports? Incorrect wiring and termination will result in unstable operation or a blank screen.

8) Electrical interference – HDBaseT is less susceptible to interference compared to regular transmissions but the location of cables and devices should be considered - could any form of interference be generated? If so, attempt to remove the source of electrical interference or move the cable run to decrease the effects of the interference.

9) Is a picture achieved when connecting the source directly to the display? If not then the problem could lie with the input or output device rather than the means of distribution i.e. the cable, receiver or matrix itself.

10) HDMI lead condition and quality – HDMI cables and connectors are delicate and can be damaged much easier than component or coax cable. Furthermore, lead quality varies dramatically, particularly in lower price brackets. Swap HDMI leads and check operation – damage to or quality of your leads could be the problem. If in doubt, swap them over. Always take care inserting and extracting your HDMI from matrix ports so as not to damage the connectors or ports.

11) Picture speckles/HD 'noise' – represents a poorly established signal that may be caused by poor quality or excessive HDMI cable lengths. Try swapping the display adaptors from a location that is functioning properly or swapping the outputs of the matrix switch used.

If the problem remains on the same screen this may be caused by a connection problem between matrix and display – turn off all equipment and swap the signal

carrying cables at both ends to ascertain if the cable or termination is at fault.

HD Noise (NO image) may be an HDCP Issue between the source and display but poor cabling can also cause this due to poor communication.

12) Blu-ray: 3D – is the equipment used 3D enabled/compatible? Is a 3D disc being played in a 3D enabled Blu-ray player or through a compatible AV receiver?

16) Colour distortion – a pink or green screen indicates an incompatibility between colour spacing formats – the commonly used RGB or YUV used by older displays. Some sources allow switching between RGB and YUV which may solve any colour problems. If not, try changing the HDMI cable between the source and the matrix to rule out defective cabling.

No Sound or Poor Quality Audio

Audio is transmitted within the video signal – there is no separate audio track – so generally a problem with sound will be accompanied by a problem with picture. However, if technical issues with audio are experienced, the cause is typically communication between sources, displays and/or AV receiver settings.

1) Have specific speaker sets or zones been enabled? Some AV receivers allow individual speaker selections assigned to specific zones in the set up so check the speakers used are fully connected to the amplifier and correctly assigned within the system set up. It may be an EDID issue in that the source reads the audio EDID from the display and only requests two channel audio and EDID copy from the AVR may be required or use an embedded EDID in the AMP or Matrix.

NOTE **If problems are experienced when an AV receiver is used, the cause is usually the settings of the AVR itself.**
Refer to the AVR manufacturer's guidelines on the correct settings to use for your requirements.

2) Consistency of audio output between devices – Is there any discrepancy between the audio output of the source, the audio or zonal settings of the AV receiver and the speaker configuration used needed for successful audio replication? If outputting 7.1, make sure all devices connected are also outputting 7.1

NOTE Occasionally with some sources, the device settings allow the specification of audio output through a TV or an HDMI port. If using an AV receiver, check the HDMI output option is selected.

3) Do all the local sources work through the AV receiver?
Check the operation of each source individually.

Bandwidth

1) If using a graphics-based source (such as a PC/Mac/media server), make sure the source resolution is set to a maximum of 4096x2160p 30Hz. Higher resolutions available for graphics-based systems require higher bandwidth that may affect transmission of signals as well as incompatibility with devices.

IR

1) Check emitters at the IR TX transmitter end and receivers at the IR RX receiver end – are they connected to the correct ports on the matrix and display receiver.

2) Is the emitter correctly positioned on the source?
Fix the emitter directly over the infrared sensor of the source and attach using the adhesive backing.

NOTE Locate the infrared source sensor by using a flashlight to find the sensor within the facia of the source display. If necessary, secure the emitter over the sensor with a small amount of contact adhesive.

3) Is the remote handset powered and sending a signal? IR is invisible to the naked eye, so use a digital camera/ phone camera to check the remote signal – point the camera at the remote control when pressing a button. The remote transmitter can be seen flashing to indicate a signal being sent. Replace batteries if flashing is not seen on the digital camera screen.

4) UTP Termination Issues – ensure cables and RJ45 terminations are correct and in good condition at both transmitter and receiver ends to see if control is established. If so, a possible re-termination of the cable could remedy the problem.

5) Are WyreStorm emitters and receivers being used? The use of third party products/magic eyes may not be compatible. Always use WyreStorm components included with your purchase or check compatibility of third party control systems with your WyreStorm dealer.

6) IR dropout issues - these can be due to exterior influences emitting infrared radiation that can interrupt IR signals. Ensure emitters and receivers are away from the following causes of IR interference.
• Direct sunlight, Fluorescent lighting (on cold start up)
• Halogen lighting
• Plasma screens

If problems persist, swap out the IR emitters and receivers to rule out faults with the units themselves. Use emitters you know are fully operational to test working condition.

Reactivate the IR call-back function on your matrix and swap IR ports on the matrix to rule out a fault with thematrix or connection ports.

Should IR remain unresponsive, turn off and disconnect all cables from the matrix and reconnect zones one at a time to assess if one location in particular is the problem. If so, run new cables directly to the display – if this fixes the problem, it is likely that electromagnetic interference / damage to the cable somewhere along the run is causing the IR signal to drop out. Investigate and remove EM interference from the run or replace damaged UTP cable.

15. FAQ

Cat5e or 6?
While our equipment is tested and graded to Cat5e cable standard; tests have shown that better results are achieved when using Cat6 cable. The lower AWG (American Wire Gauge) uses thicker copper cores ensure better signal transfer/Transmission rates. Newly installed cabling should always conform to Part P Regulation and BS 7671 (17th Edition), and should be terminated to 568B standard.

Can I use a single Cat 5e/Cat 6 cable?
HDBaseT technology only requires a single cable; all features associated with twin cable are supported with the added benefit of RS232 control and Ethernet on 100m/328ft HDBaseT products, with 70m/230ft HDBaseT products removing Ethernet passthrough functionality.

How far can the signal travel?
Under perfect transmission conditions our HDBaseT receivers will operate at 50m, 70m or 100m (@1080p) depending on the model used. Perfect conditions means no electrical interference, straight cable runs with no bends or kinks and no patch panels or wall outlets.

If some of the above are factors in your installation then signal strength and bandwidth can be compromised. If a cable run is reaching the upper limit of the receiver's capabilities, then the signal can be boosted by way of an AMP-001-010 as an in-line repeater up to 7 times (490m) using HDBaseT technology.

What about 3D?
The RX-70-4K, all of our matrix switches and most of our extender products will pass-through a 3D Blu-ray signal (frame packing - Blu-Ray & Stereoscopic - satellite/cable).

How do I control the sources?
All of our HDMI distribution products support IR pass-through from point-to-point extender sets to AMP and HDBaseT matrices. Most of the range now supports wideband IR meaning it is compatible with any IR device available on the market.

Our PP and HDBaseT matrix range (Cat 5e/Cat6) has IR pass-through from each of the outputs and has discrete IR outputs at the switch end, meaning you can have multiple identical sources yet the IR would be routed only to the applicable source.

Do I need power at the TV end?
No. Our RX-70-4K HD display adaptors require no power supply at the TV end. To operate, the PoH receivers draw the power from an PoH matrix or PoH Transmitter. NON PoH devices require 12v. It's important that these are powered locally and do not receive remote power from the rack as there can be issues resulting from voltage drop along the length of cable.

Are WyreStorm products compatible with HDMI 1.4?
HDMI 1.4 refers to a list of 'features' that a device is capable of supporting, including Ethernet channel, return audio channel, 3D etc. Due to the continuously evolving nature of the technology, HDMI Licensing LLC have now decided to simplify terminology by testing and referring to cable in terms of STANDARD or HIGH-SPEED rather than in generations 1.3, 1.4 etc.

• STANDARD (or "category 1") HDMI cables perform at speeds of 75Mhz or up to 6.75Gbps, which is the equivalent to a 720p/1080i signal – These HDMI cables are NOT recommended.
• All WyreStorm equipment support HIGH-SPEED (or "category 2") HDMI cables that have been tested to perform at speeds of 340Mhz or up to 10.2Gbps, which is the highest bandwidth currently utilised over an HDMI cable and can successfully handle 1080p signals including those at increased colour depths and/

or increased refresh rates from the Source and 4K resolutions at 30Hz, 4:2:2 colour. High-Speed cables are also able to accommodate higher resolution displays, such as WQXGA cinema monitors (resolution of 2560 x 1600).

What about screens with different resolution capabilities?
When sending a signal point to point a TV will communicate it's capabilities to the source, then the source will output a suitable signal that compatible (i.e. 1080p Stereo audio).

If you were to use a matrix switch with three 1080p screens and one 1080i screen, the resultant image would be1080i across all screens. The matrix switches do not scale per output but instead negotiate with the source a signal that all screens are capable of supporting.

How does the Matrix cope with HDCP?
HDCP (High Definition Copyright Protection) is a feature built in to HDMI devices to prevent theft of or illegal distribution of HD content.

Unlike competing products, WyreStorm matrix switches are legal and comply with HDCP regulations. They do this by assigning a "key" to every display connected to the switch. HDCP "keys" are assigned to a display when connected to a HDMI device normally. This doesn't change when connected to a switch; it just assigns more of them.

I can get 1080p but not 4K at a TV location
Firstly ensure that both the source is capable of outputting 4K and that the TV is a UHD screen. If this is the case then the display receiver or PP-POH Matrix may require EDID management setting up using the DIP switches. This useful feature provides a successful "send and receive" to ensure swift and stable EDID negotiation between the source and display. See Troubleshooting section for more tips on problem solving.

I cannot get a signal from my A/V receiver along a Cat 5e extender set
Check to ensure that the A/V Receiver isn't adding CEC (HDMI Control Protocol) to the outgoing signal, this can sometimes have an effect on the HDMI signal.

16.   Maintenance

Clean this unit with a soft, dry cloth only. Never use alcohol, paint thinner or other harsh chemicals.

17.   Provided Service

1. Damage requiring service: This unit should be serviced by a qualified service personnel if:
• The DC power supply or AC adaptor has been damaged.
• Objects or liquid have gotten into the unit.
• The unit has been exposed to rain.
• The unit does not operate normally or exhibits a marked change in performance.
• The unit has been dropped or the cabinet damaged.

2. Servicing Personnel: Do not attempt to service the unit beyond that described in these operating instructions. Refer all other servicing to authorised servicing personnel.

3. Replacement Parts: When parts need replacing, ensure parts approved by the manufacturer are used – either those specified by the manufacturer or parts possessing the same characteristics as the original parts. Be aware – unauthorised substitutes may result in fire, electric shock, or other hazards and will invalidate your warranty.

4. Safety Check: After repairs or service, ask the service personnel to perform safety checks to confirm the unit is in proper working condition.

When shipping the unit, carefully pack and send it prepaid, with adequate insurance and preferably in the original packaging.

Please include a document or letter detailing the reason for return and include a daytime telephone number and/or email address where you can be contacted.

18.   Mail-in-service

If repair is required during the limited warranty period, the purchaser will be required to provide a sales receipt or other proof of purchase, indicating date and location of purchase as well as the price paid for the product. The customer will be charged for the repair of any unit received unless such information is provided.

19i.   Warranty

Should you feel your product does not function adequately due to defects in materials or workmanship, we (referred to as "the warrantor") will, for the length of the period indicated below (starting from the original date of purchase) either:

a) Repair the product with new or refurbished parts.
or
b) Replace it with a new or refurbished product.

Limited warranty period:
All WyreStorm products are covered by a 3 year PARTS and LABOUR warranty. During this period there will be no charge for unit repair, replacement of unit components or replacement of product if necessary.

The decision to repair or replace will be made by the warrantor. The purchaser must mail-in the product during the warranty period. This limited warranty only covers the product purchased as new and is extended to the original purchaser only. It is non-transferable to subsequent owners, even during the warranty period.
A purchase receipt or other proof of original purchase date is required for the limited warranty service.

19ii.   Warranty Limits & Exclusions

1. This Limited Warranty ONLY COVERS failures due to defects in materials or workmanship and DOES NOT COVER normal wear and tear or cosmetic damage.

The limited warranty also DOES NOT COVER damage that occurs in shipment or failures caused by products not supplied by the warrantor, failures resulting from accident, misuse, abuse, neglect, mishandling, misapplication, alteration, incorrect installation, set-up adjustment, implementation of/to consumer controls, improper maintenance, power line surge, lightening damage, modification, service by anyone other than a manufacturer-approved service centre or factory-authorised personnel, or damage attributable to acts of God.

2. There are no express warranties except as listed under "limited warranty coverage." The warrantor is not liable for incidental or consequential damage resulting from the use of this product or arising out of any breach of this warranty.

For example: damages for lost time, the cost of having a person/persons remove or re-install previously installed equipment, travel to and from service location, loss of or damage to media, images, data or other recorded/stored content. The items listed here are not exclusive, but are for illustration only.

Parts and service not covered by this limited warranty are not the responsibility of the warrantor and should be considered the responsibility of the individual.

20.   Glossary

Acronym	Complete Term
AC	Alternating Current
COM	Communication Port
DHCP	Dynamic Host Configuration Protocol
DIP	Dual In-line Package
DTS	Digital Theater Systems
DVD	Digital Versatile Disc
EDID	Extended Display Identification Data
GUI	Graphical User Interface
HD	High Definition
HDBT	HDBaseT
HDCP	High-bandwidth Digital Content Protection
HDMI	High Definition Multimedia Interface
IR	Infrared
LAN	Local Area Network
LED	Light Emitting Diode
LPCM	Linear Pulse-code Modulation
PC	Personal Computer
PCM	Pulse-code Modulation
PoH	Power over HDBT
TMDS	Transition Minimized Differential Signal
TV	Television
UART	Universal Asynchronous Receiver/Transmitter

INSTALLATION REFERENCE LOGS

21. Installation Reference Log - Input Reference Log

INPUT				
Input number on Matrix	Source Location	Source Details	Source resolution & audio settings	Cable Number
1				
2				
3				
4				
5				
6				
7				
8				

Technical Support: support@wyrestorm.com US: +1 866 677 0053 EU: +44 (0) 1793 230 343

21. Installation Reference Log - Output Reference Log

OUTPUT				
Output number on Matrix	Output Location	Display Details	Display Resolution & Audio Settings	Cable Number
1				
2				
3				
4				
5				
6				
7				
8				

22. Installation Notes

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We reserve the right to change specification or product dimensions at any time.